

MULTI POWER MONITORING MODULE
(clamp-on current sensor CLSE, LonWORKS)MODEL **R7LWTU****BEFORE USE**

Thank you for choosing us. Before use, please check contents of the package you received as outlined below.

If you have any problems or questions with the product, please contact our sales office or representatives.

■ PACKAGE INCLUDES:

Multi power monitoring module or extension module(1)
NeuronID label.....(2)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.

The PC Configurator Software can use “monitoring measured values” and “loop test” functions for the R7LWTU. For detailed information on the PC configuration, refer to the PMCFG users manual. The PMCFG PC Configurator Software is downloadable at our web site.

POINTS OF CAUTION**■ POWER INPUT RATING & OPERATIONAL RANGE**

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
 - 100 – 240V AC rating: 85 – 264V, 50/60 Hz
 - Basic module < 5VA
 - Basic module + Extension module < 6VA
 - 110 – 240V DC rating: 99 – 264V
 - Basic module < 1.5W
 - Basic module + Extension module < 2W

■ GENERAL PRECAUTIONS

- Before you remove or mount the unit, turn off the power supply and input signal for safety.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -10 to +55°C (14 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

■ WIRING

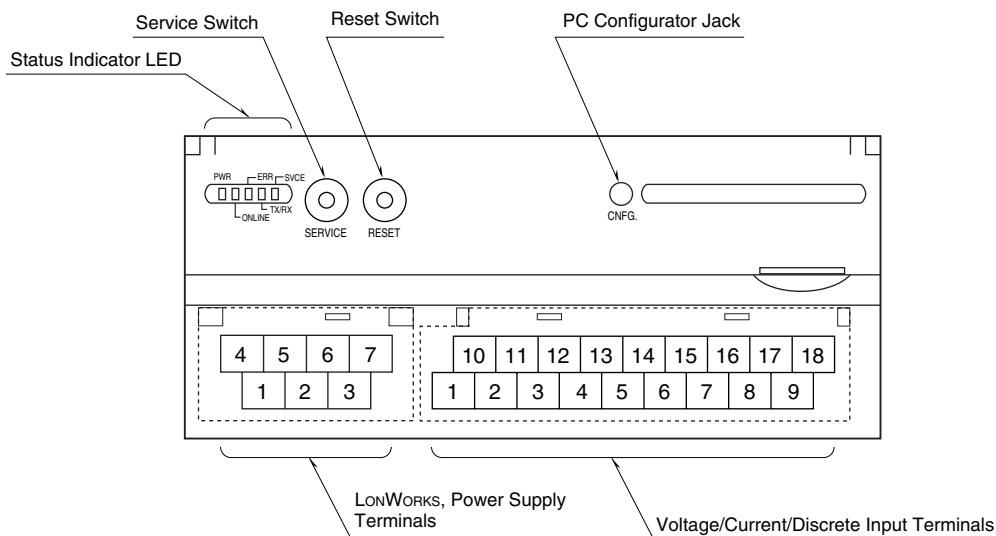
- Wiring to the unit must be conducted by qualified service personnel.
- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.

■ AND

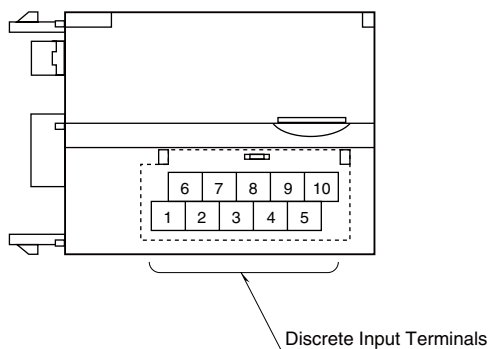
- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

COMPONENT IDENTIFICATION

■ BASIC MODULE



■ EXTENSION MODULE



■ STATUS INDICATOR LED

ID	COLOR	STATUS	FUNCTION
PWR	Green	ON	Internal power 5V normal operating
		OFF	Internal power 5V abnormality
ONLINE	Green	ON	Online
		Blink ≈ 2 Hz	Wink message received
		OFF	Abnormality
ERR	Red	ON	Writing in non-volatile memory
		Blink ≈ 0.5 Hz	No input or input overflow
		Blink ≈ 2 Hz	Abnormality
		OFF	Normal operating
TX/RX	Green	ON	In communication
		OFF	No connection
SVCE	Green	ON	Internal program error
		Blink ≈ 0.5 Hz	No network service
		OFF	Normal operating

■ SERVICE SWITCH

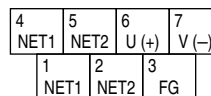
Used to identify the node in LONWORKS network configuration.

■ RESET SWITCH

Used to reset the Neuron Chip. Press the switch behind the front cover to reset.

Control functions are halted while completing resetting and restarting. Confirm no danger before conducting resetting.

■ POWER SUPPLY, LONWORKS TERMINAL ASSIGNMENT



NO.	ID	FUNCTION
1	NET 1	LONWORKS communication 1
2	NET 2	LONWORKS communication 2
3	FG	FG
4	NET 1	LONWORKS communication 1
5	NET 2	LONWORKS communication 2
6	U (+)	Power input (+)
7	V (-)	Power input (-)

Note: LONWORKS wiring must be paired between NET1 terminals and/or NET2 terminals.

INPUT TERMINAL ASSIGNMENT

Basic module

1 Circuit, 4 point discrete

10	11	12	13	14	15	16	17	18
P3	NC	NC	1K	2K	3K	DI1+	DI3+	COM
1	2	3	4	5	6	7	8	9
P1	P2	N	1L	2L	3L	DI2+	DI4+	COM

PIN No.	ID	FUNCTION	PIN No.	ID	FUNCTION
1	P1	Voltage Input P1	10	P3	Voltage Input P3
2	P2	Voltage Input P2	11	NC	Unused
3	N	Voltage Input N	12	NC	Unused
4	1ch 1L	1ch current input 1L	13	1ch 1K	1ch current input 1K
5	1ch 2L	1ch current input 2L	14	1ch 2K	1ch current input 2K
6	1ch 3L	1ch current input 3L	15	1ch 3K	1ch current input 3K
7	DI2 +	Discrete input 2	16	DI1 +	Discrete input 1
8	DI4 +	Discrete input 4	17	DI3 +	Discrete input 3
9	COM	Discrete input common	18	COM	Discrete input common

2 Circuits

10	11	12	13	14	15	16	17	18
P3	NC	NC	1K	2K	3K	1K	2K	3K
1	2	3	4	5	6	7	8	9
P1	P2	N	1L	2L	3L	1L	2L	3L

PIN No.	ID	FUNCTION	PIN No.	ID	FUNCTION
1	P1	Voltage Input P1	10	P3	Voltage Input P3
2	P2	Voltage Input P2	11	NC	Unused
3	N	Voltage Input N	12	NC	Unused
4	1ch 1L	1ch current input 1L	13	1ch 1K	1ch current input 1K
5	1ch 2L	1ch current input 2L	14	1ch 2K	1ch current input 2K
6	1ch 3L	1ch current input 3L	15	1ch 3K	1ch current input 3K
7	2ch 1L	2ch current input 1L	16	2ch 1K	2ch current input 1K
8	2ch 2L	2ch current input 2L	17	2ch 2K	2ch current input 2K
9	2ch 3L	2ch current input 3L	18	2ch 3K	2ch current input 3K

EXTENSION MODULE

6	7	8	9	10
COM	DI1+	DI3+	DI5+	DI7+
1	2	3	4	5
COM	DI2+	DI4+	DI6+	DI8+

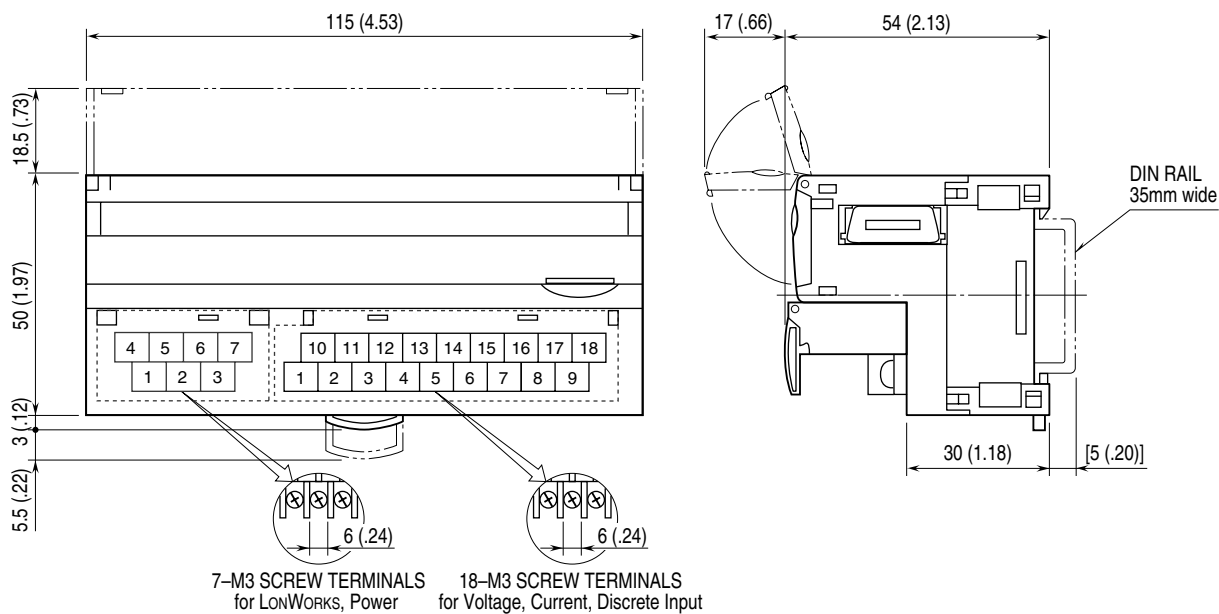
No.	ID	FUNCTION	No.	ID	FUNCTION
1	COM	Common	6	COM	Common
2	DI2 +	Discrete input 2	7	DI1 +	Discrete input 1
3	DI4 +	Discrete input 4	8	DI3 +	Discrete input 3
4	DI6 +	Discrete input 6	9	DI5 +	Discrete input 5
5	DI8 +	Discrete input 8	10	DI7 +	Discrete input 7

TERMINAL CONNECTIONS

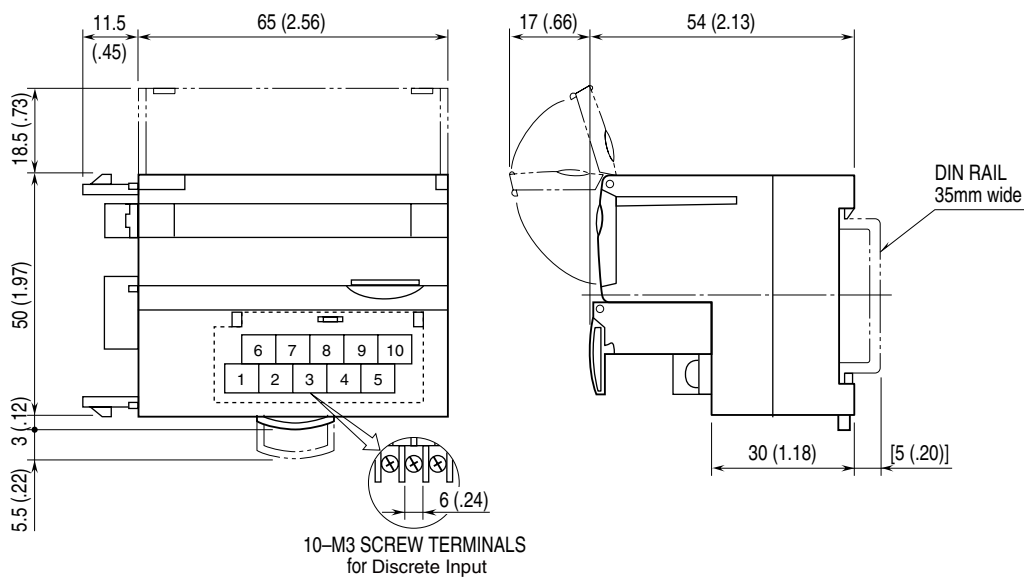
Connect the unit as in the diagram below.

■ **EXTERNAL DIMENSIONS** unit: mm (inch)

• **BASIC MODULE**



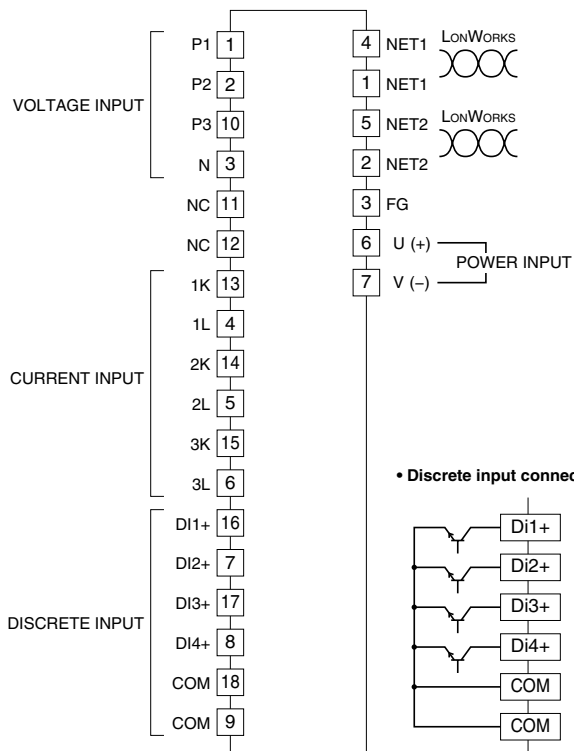
• **EXTENSION MODULE**



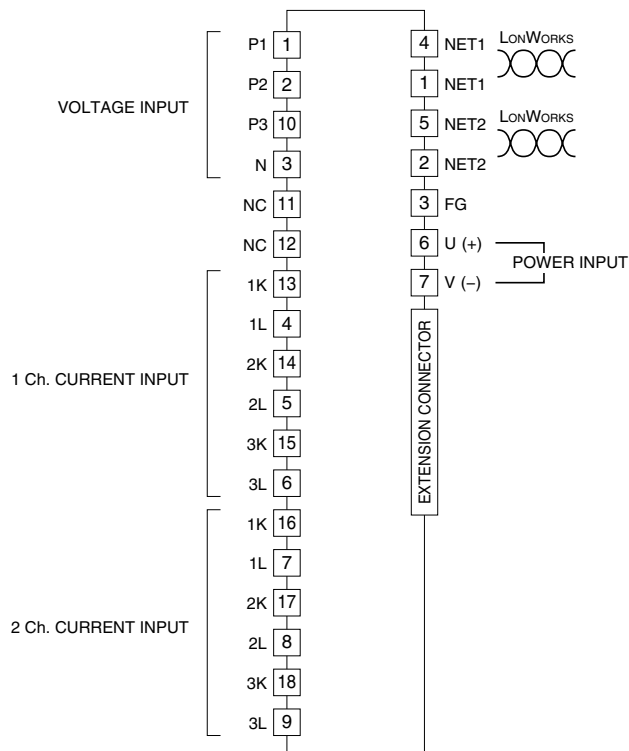
■ CONNECTION DIAGRAM

■ BASIC MODULE

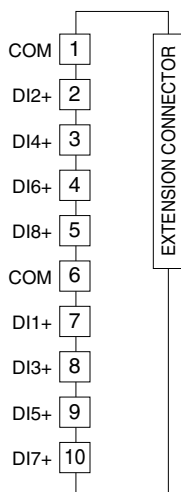
• 1 Circuit, 4-point Discrete Inputs



• 2 Circuits



■ EXTENSION MODULE



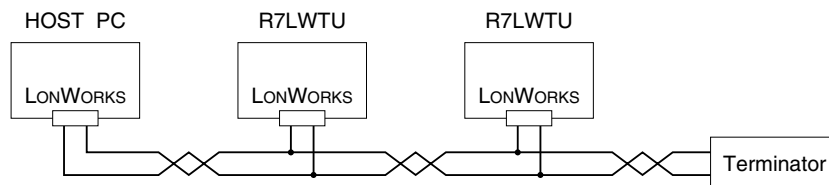
INPUT WIRING

System / Application	Terminal	System / Application	Terminal
Single-phase / 2-wire		Single-phase / 3-wire Three-phase / 3-wire unbalanced load (2CT)	
Three-phase / 3-wire, balanced load		Three-phase / 4-wire, balanced load	
Three-phase / 4-wire, unbalanced load			

Note: Use CLSE for CT.
Grounding is unnecessary for low-voltage circuit.

COMMUNICATION CABLE CONNECTIONS

HOST PC CONNECTION



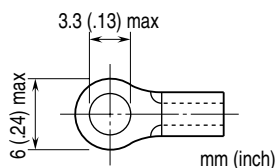
WIRING INSTRUCTIONS

SCREW TERMINAL

Torque: 0.5 N·m

SOLDERLESS TERMINAL

Refer to the drawing below for recommended ring tongue terminal size. Spade tongue type is also applicable.
Applicable wire size: 0.25 to 1.65 mm² (AWG 22 to 16)
Recommended manufacturer: Japan Solderless Terminal MFG. Co., Ltd, Nichifu Co., Ltd



EXTENSION MODULE

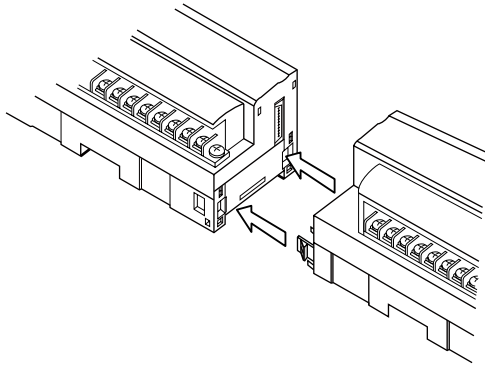
A 'basic' module (Model: R7LWTU-221-AD4) can be attached with one 'extension' module. The extension module is powered from the basic module.

By combining two modules, single station can handle mixed 2 circuits power and discrete inputs.

Turn the power on, after the extension module is connected.

■ CONNECTING THE EXTENSION MODULE

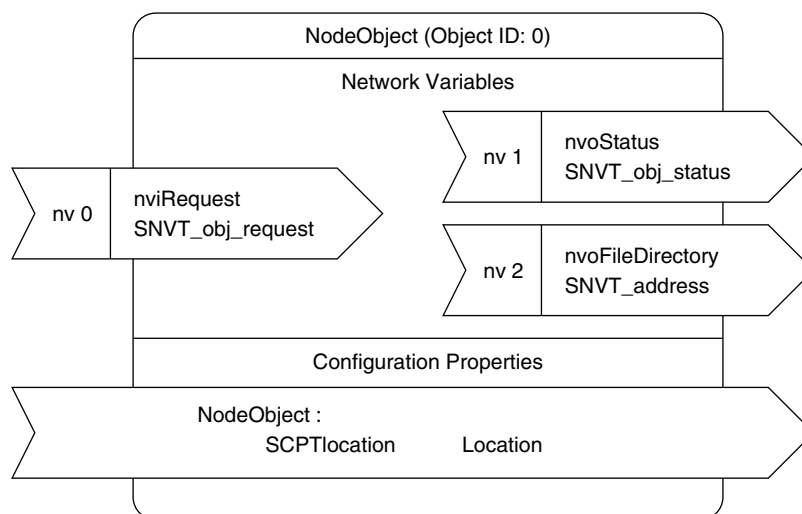
- 1) Remove the extension connector cover located at the side of the basic module.
- 2) Connect the extension module.



- 3) Mount the combined module on a DIN rail.

FUNCTIONAL BLOCKS

■ NodeObject FUNCTIONAL BLOCK



■ NodeObject FUNCTIONAL BLOCK

• Network Variable

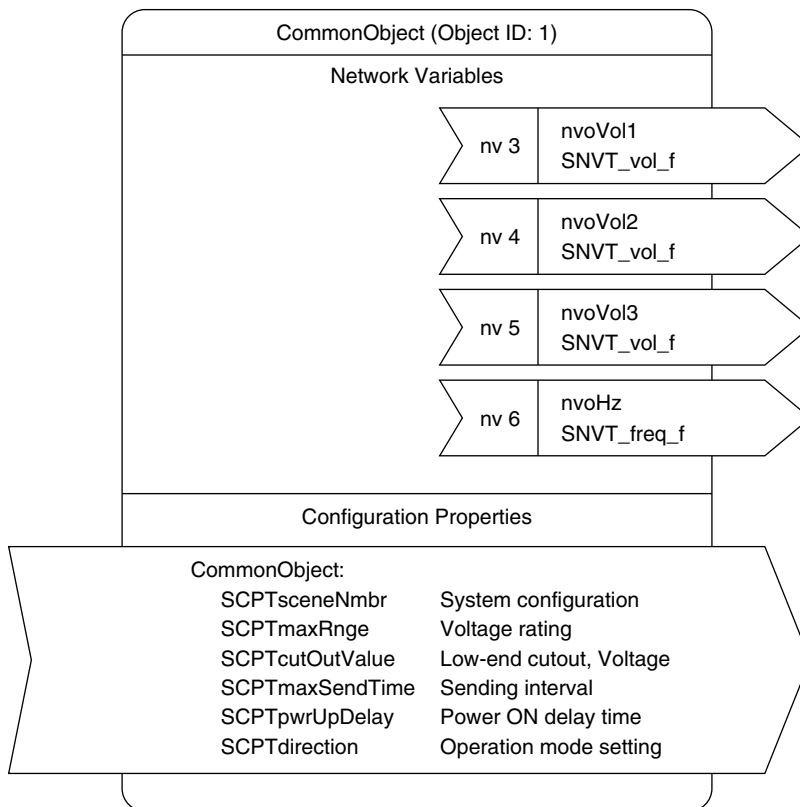
nv	NETWORK VARIABLE	TYPE	EXPLANATIONS				
0	nviRequest	SNVT_obj_request	<p>A request is provided through Object ID (object_id) and Request (object_request) and its result is output through nvoStatus. Usable object_id and object_request are as follows:</p> <table border="1"> <tr> <td>object_id</td> <td> 0 : All objects 1 to 3: (R7LWTU-21x-AD4) or 1 to 6: (R7LWTU-22x-AD4): Specify Object ID of the Functional Block Other : Invalid_id </td> </tr> <tr> <td>object_request</td> <td> RQ_NORMAL Used to return the module to normal status. Disabled objects are enabled. RQ_ENABLE Used to enable disabled objects. RQ_DISABLE Used to disable a specified object. Disabled objects stop sending or resetting network variables. RQ_REPORT_MASK Used to set 1 at supported status values and output to nvoStatus. RQ_UPDATE_STATUS Used to obtain a specified object status. If all objects are specified, OR result of individual status values is set at nvoStatus. RQ_CLEAR_STATUS Used to clear error counter and others. The following Requests are NOT supported. RQ_SELF_TEST RQ_OVERRIDE RQ_RMV_OVERRIDE RQ_UPDATE_ALARM RQ_CLEAR_ALARM RQ_CLEAR_RESET RQ_RESET </td> </tr> </table>	object_id	0 : All objects 1 to 3: (R7LWTU-21x-AD4) or 1 to 6: (R7LWTU-22x-AD4): Specify Object ID of the Functional Block Other : Invalid_id	object_request	RQ_NORMAL Used to return the module to normal status. Disabled objects are enabled. RQ_ENABLE Used to enable disabled objects. RQ_DISABLE Used to disable a specified object. Disabled objects stop sending or resetting network variables. RQ_REPORT_MASK Used to set 1 at supported status values and output to nvoStatus. RQ_UPDATE_STATUS Used to obtain a specified object status. If all objects are specified, OR result of individual status values is set at nvoStatus. RQ_CLEAR_STATUS Used to clear error counter and others. The following Requests are NOT supported. RQ_SELF_TEST RQ_OVERRIDE RQ_RMV_OVERRIDE RQ_UPDATE_ALARM RQ_CLEAR_ALARM RQ_CLEAR_RESET RQ_RESET
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object_request	RQ_NORMAL Used to return the module to normal status. Disabled objects are enabled. RQ_ENABLE Used to enable disabled objects. RQ_DISABLE Used to disable a specified object. Disabled objects stop sending or resetting network variables. RQ_REPORT_MASK Used to set 1 at supported status values and output to nvoStatus. RQ_UPDATE_STATUS Used to obtain a specified object status. If all objects are specified, OR result of individual status values is set at nvoStatus. RQ_CLEAR_STATUS Used to clear error counter and others. The following Requests are NOT supported. RQ_SELF_TEST RQ_OVERRIDE RQ_RMV_OVERRIDE RQ_UPDATE_ALARM RQ_CLEAR_ALARM RQ_CLEAR_RESET RQ_RESET						

nv	NETWORK VARIABLE	TYPE	EXPLANATIONS	
1	nvoStatus	SNVT_obj_status	The result of a request entered at nviRequest is output with Object ID and status value.	
			FIELD	EXPLANATIONS
			object_id	Object ID Bits following object_id show OR result of individual objects when 0 is set.
			invalid_id	Invalid Object ID
			invalid_request	Invalid Request
			disabled	Object is disabled. Disabled objects stop sending or resetting network variables.
			out_of_limits	The relevant bit reads 1 when voltage, current or AC frequency is out of the respective rated range. 0 is read otherwise.
			open_circuit	Not supported (always 0)
			out_of_service	Not supported (always 0)
			mechanical_fault	Not supported (always 0)
			feedback_failure	Not supported (always 0)
			over_range	Not supported (always 0)
			under_range	Not supported (always 0)
			electrical_fault	Not supported (always 0)
			unable_to_measure	1 is read when network variables are not updated due to certain function failure of the module.
			comm_failure	Not supported (always 0)
			fail_self_test	Not supported (always 0)
			self_test_in_progress	Not supported (always 0)
			locked_out	Shows the module is online but unable to operate normally. 1 is read at the bit when unable_to_measure bit turns to 1.
			manual_control	Not supported (always 0)
			in_alarm	Not supported (always 0)
			in_override	Not supported (always 0)
			report_mask	Shows the response is for RQ_REPORT_MASK request. With the bit read 1, all other bits supported by the module read 1 and unsupported ones read 0.
programming_mode	Not supported (always 0)			
programming_fail	Not supported (always 0)			
alarm_notify_disabled	Not supported (always 0)			
reserved1	Reserved (always 0)			
reserved2	Reserved (always 0)			
2	nvoFileDirectory	SNVT_address	Used by integration tools.	

• Configuration Property

NETWORK VARIABLE	TYPE {Range} {Default}	EXPLANATIONS
SCPTlocation	SNVT_str_asc {ascii 31 characters} { "" }	Subsystem information required for use with network recovery tools. Max. 31 ASCII characters including terminating null character.

■ CommonObject FUNCTIONAL BLOCK



■ CommonObject FUNCTIONAL BLOCK

• Network Variable

nv	NETWORK VARIABLE	TYPE	EXPLANATIONS
3	nvoVol1	SNVT_vol_f	Voltage 1*1
4	nvoVol2	SNVT_vol_f	Voltage 2*1
5	nvoVol3	SNVT_vol_f	Voltage 3*1
6	nvoHz	SNVT_freq_f	Frequency

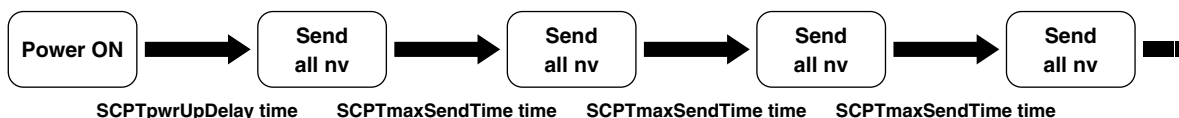
*1. Assignments depend upon system configuration.

Single-phase/2wire	Voltage 1: Phase R	Voltage 2: 0	Voltage 3: 0
Single-phase/3-wire	Voltage 1: Phase R	Voltage 2: Delta T – R	Voltage 3: Phase T
Three-phase/3-wire	Voltage 1: Delta R – S	Voltage 2: Delta S – T	Voltage 3: Delta T – R
Three-phase/4-wire	Voltage 1: Phase R	Voltage 2: Phase S	Voltage 3: Phase T

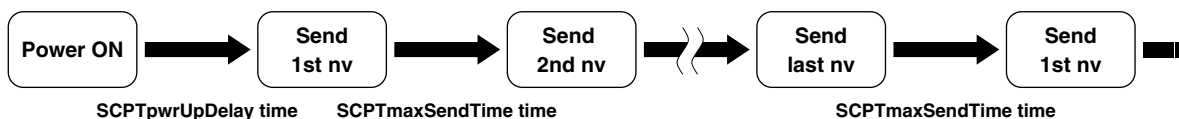
• Configuration Property

NETWORK VARIABLE	TYPE { Range } { Default }	EXPLANATIONS
SCPTsceneNmbr	unsigned short { 0 to 5 } { 1 }	System configuration 0 : Single-phase / 2-wire 1 : Single-phase / 3-wire 2 : Three-phase / 3-wire, balanced load (1CT) 3 : Three-phase / 3-wire, unbalanced load (2CT) 4 : Three-phase / 4-wire, balanced load (1CT) 5 : Three-phase / 4-wire, unbalanced load (3CT)
SCPTmaxRnge	SNVT_vol_f { 50 - 400 000 } { 110 }	Voltage rating The numbers of the specified value after the decimal point are rounded down. When external voltage transformer is used, secondary voltage rating is fixed to 110 V. The specified value is regarded as primary voltage rating to calculate the voltage. In this case, the specified value can be set and utilized up to 400 kV. When SCPTdirection set the direct voltage input, the specified value is regarded as voltage rating to calculate the voltage. In this case, the specified value can be set and utilized up to 240 V.
SCPTcutOutValue	SNVT_temp_p { 0.0 to 99.9 } { 1.0 }	Low-end cutout, Voltage The voltage below (rated voltage x Specified value / 100) is disregarded and the data is set to 0 V.
SCPTmaxSendTime	SNVT_time_sec { 0.0 to 6553.4 } { 3.0 }	Sending time intervals of output network variables. The module does not send out network variables when 6553.5 (sec.) is set. Used for polling.
SCPTpwrUpDelay	SNVT_time_sec { 0.0 to 6553.4 } { 0.0 }	Delay time to start sending network variables after the power is turned on.
SCPTdirection	SNVT_state { 0 or 1 } { 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 }	Bit 0: The network variable's sending pattern by each sending cycle is determined. See the figure below. 0 = All bound variables are sent. 1 = Bound variables are sent one by one. Bit 1: Set '1', when direct voltage input is used without external voltage transformer.

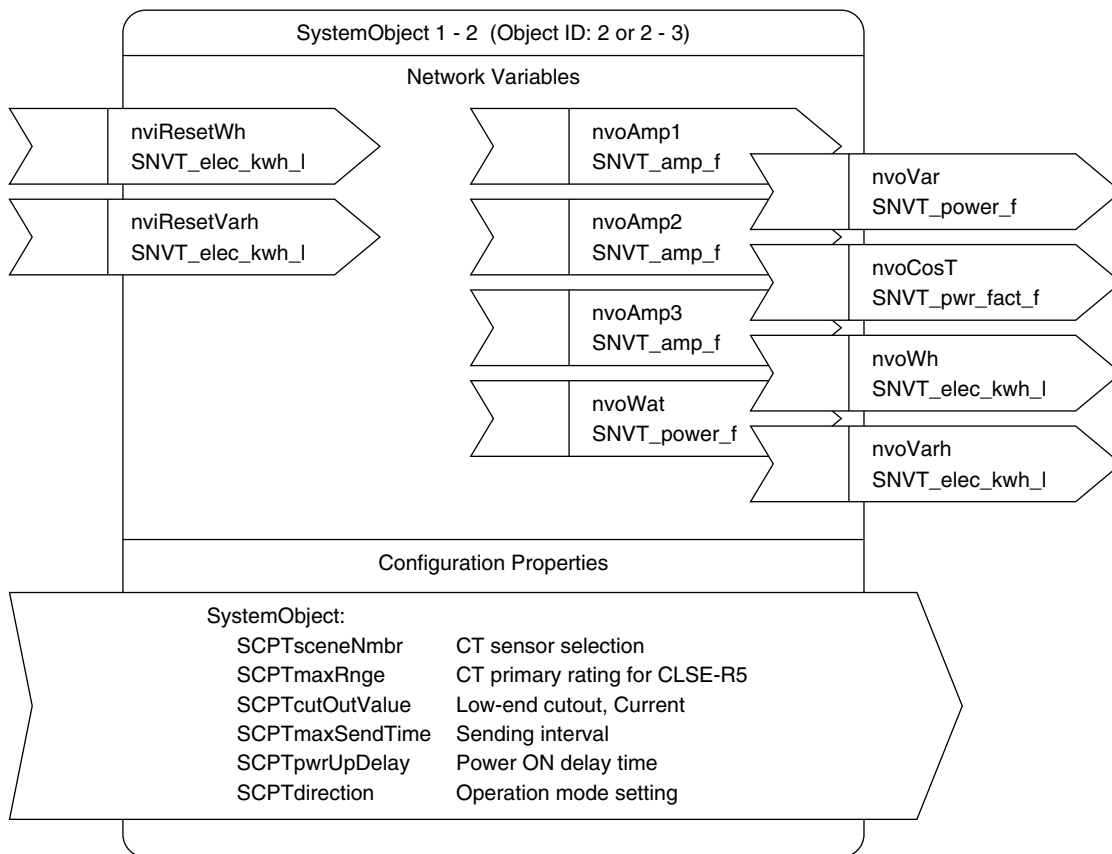
• SCPTdirection bit 0 = 0



• SCPTdirection bit 0 = 1



■ SystemObject 1 to 2 FUNCTIONAL BLOCK



■ SystemObject FUNCTIONAL BLOCK

• Network Variable

nv		NETWORK VARIABLE	TYPE	EXPLANATIONS
R7LWTU-211	R7LWTU-221			
7	7 to 8	nviResetWh	SNVT_elec_kwh_l	Active energy, preset 'nvoWh' is preset by specified value. 'nvoWh' is reset (clear to 0) when '0.0' is entered.
8	9 to 10	nviResetVarh	SNVT_elec_kwh_l	Reactive energy, preset 'nvoVarh' is preset by specified value. 'nvoVarh' is reset (clear to 0) when '0.0' is entered.
9	11 to 12	nvoAmp1	SNVT_amp_f	Current 1*2
10	13 to 14	nvoAmp2	SNVT_amp_f	Current 2*2
11	15 to 16	nvoAmp3	SNVT_amp_f	Current 3*2
12	17 to 18	nvoWat	SNVT_power_f	Active power
13	19 to 20	nvoVar	SNVT_power_f	Reactive power
14	21 to 22	nvoCosT	SNVT_pwr_fact_f	Power factor
15	23 to 24	nvoWh	SNVT_elec_kwh_l	Active energy
16	25 to 26	nvoVarh	SNVT_elec_kwh_l	Reactive energy

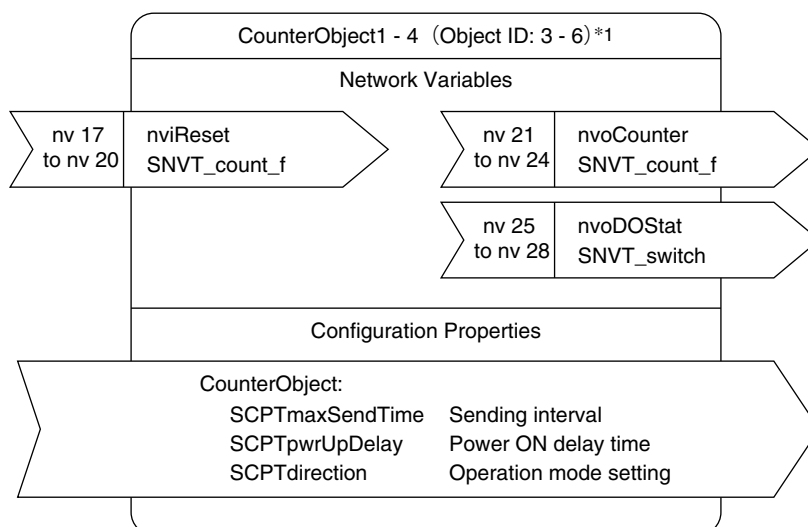
*2. Assignments depend upon system configuration.

Single-phase/2-wire	Current 1: Line R	Current 2: 0	Current 3: 0
Single-phase/3-wire	Current 1: Line R	Current 2: Neutral	Current 3: Line T
Three-phase/3-wire	Current 1: Line R	Current 2: Line S	Current 3: Line T
Three-phase/4-wire	Current 1: Line R	Current 2: Line S	Current 3: Line T

• Configuration Property

NETWORK VARIABLE	TYPE { Range } { Default }	EXPLANATIONS
SCPTsceneNmbr	unsigned short { 0 to 5 } { 0 }	CT sensor selection 0: CLSE-R5 (5A) 1: CLSE-05 (50A) 2: CLSE-10 (100A) 3: CLSE-20 (200A) 4: CLSE-40 (400A) 5: CLSE-60 (600A)
SCPTmaxRnge	SNVT_amp_f { 5 to 20 000 } { 5 }	Primary rating when CLSE-R5 is chosen for CT sensor The numbers of the specified value after the decimal point are rounded down. The current is calculated by primary rating of the sensor when the sensor other than CLSE-R5 is chosen.
SCPTcutOutValue	SNVT_temp_p { 0.0 to 99.9 } { 1.0 }	Low-end cutout, Current The current below (rated current × specified value / 100) is disregarded and the data is set to 0 V. The rated current is the value specified by SCPTmaxRng when CLSE-R5 is chosen for CT sensor. The rated current is primary rating of the sensor when the sensor other than CLSE-R5 is chosen.
SCPTmaxSendTime	SNVT_time_sec	Shared use with SCPTmaxSendTime of Common Object
SCPTpwrUpDelay	SNVT_time_sec	Shared use with SCPTpwrUpDelay of Common Object
SCPTdirection	SNVT_state	Shared use with SCPTdirection of Common Object

CounterObject 1 to 4 FUNCTIONAL BLOCK



*1. CounterObject 1 to 8 (Object ID: 4 to 11) when R7LWTU-221 and extension module are used.

CounterObject FUNCTIONAL BLOCK

• Network Variable

nv		NETWORK VARIABLE	TYPE	EXPLANATIONS
R7LWTU-211	R7LWTU-221 + Extension Module			
17 to 20	27 to 34	nviReset	SNVT_count_f	Counter, preset 'nvoCounter' is preset by specified value. 'nvoCounter' is reset (clear to 0) when '0.0' is entered.
21 to 24	35 to 42	nvoCounter	SNVT_count_f	Counter data
25 to 28	43 to 50	nvoDOStat	SNVT_switch	Status of the contact { 0.0 0 } : OFF { 100.0 1 } : ON

• Configuration Property

NETWORK VARIABLE	TYPE	EXPLANATIONS
SCPTmaxSendTime	SNVT_time_sec	Shared use with SCPTmaxSendTime of Common Object
SCPTpwrUpDelay	SNVT_time_sec	Shared use with SCPTpwrUpDelay of Common Object
SCPTdirection	SNVT_state	Shared use with SCPTdirection of Common Object

LIGHTNING SURGE PROTECTION

We offer a series of lightning surge protector for protection against induced lightning surges. Please contact us to choose appropriate models.